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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,059	07/24/2001	Yukio Kyusho	P/3236-29	6066

7590 06/02/2004  
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EXAMINER	
MONBLEAU, DAVIENNE N	
ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/915,059

Applicant(s)

KYUSHO ET AL.

Examiner

Davienne Monbleau

Art Unit

2878

AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-34, 39, 40, 43-45, 48-50, 53-57, 60-64, 67-70, 73-78, 81-84, 87-92 and 95-98 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Continuation of Disposition of Claims: Claims pending in the application are 3-34,39,40,43-45,48-50,53-57,60-64,67-70,73-78,81-84,87-92 and 95-98.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed 2/18/04 on page 4 paragraph 3, with respect to the rejection(s) of claim(s) 3-34, 39, 40, 43-45, 48-50, 53-57, 60-64, 67-70, 73-78, 81-84, 87-92 and 95-98, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art reference: Smart (US 6,339,604).

Claims 3-34, 39, 40, 43-45, 48-50, 53-57, 60-64, 67-70, 73-78, 81-84, 87-92 and 95-98 are pending.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically taught or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 4, 6, 7, 9, 10, 11, 13-15, 17, 18, 20-22, 24, 25, 27-29, 31-33, 39, 40, 44, 45, 49, 50, 56, 57, 63, 64, 69, 70, 77, 78, 83, 84, 91 and 92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view of Smart (US 6,339,604) and Smart (US 6,281,471).

Regarding Claims 3 and 39, *Rieger* teaches in Figure 12 a Q-switched mode-locked pulsed laser (2) directed towards a target (118). *Rieger* further teaches in column 10 lines 50-57 that said device might be used for various applications, including laser ablation technology. Although laser ablation may be used to remove a defect in a pattern, *Rieger* does not specifically teach repairing a defect in a pattern. *Smart* '471 teaches in column 1 lines 15-32 various applications for a Q-switched pulsed laser including repair operations. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the laser in *Rieger* for repair processing, as taught by *Smart* '471, since it would be efficient in preventing damage in surrounding areas and structures (*Smart* '471 column 1 lines 16-30). *Rieger* do not teach pulse slicing. *Smart* '604 teaches in Figure 1 and in column 5 lines 32-46 slicing a single pulse from a string of pulses via an optical modulator (26) and directing that laser light to the workpiece. It would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse slicing in *Rieger*, as taught by *Smart* '604, to provide flexibility in and control over the pulse width, along with repetition rate, in order to optimize performance (*Smart* '604 column 2 lines 35-45). Also, by preventing unwanted output from impinging on the workpiece, the temperature of the workpiece is not affected. Thus any measurements taken will not be affected (*Smart* '604 column 2 lines 58-65).

Art Unit: 2878

Regarding Claims 6 and 44, see discussion on Claim 3 above. *Rieger* further teaches in Figure 12 an optical amplifier (103).

Regarding Claims 9 and 49, see discussion on Claim 3 above. *Rieger* further teaches in Figure 8 and in column 7 lines 45-67 a laser pulse multiplexing and delaying unit.

Regarding Claims 13 and 56, see discussion on Claim 3 above. *Rieger* further teaches in Figure 12 an optical amplifier (103) and in Figure 8 and in column 7 lines 45-67 a laser pulse multiplexing and delaying unit.

Regarding Claims 17 and 63, see discussion on Claim 3 above. *Rieger* further teaches in Figure 12 a wavelength-converting unit (112).

Regarding Claims 20 and 69, see discussion on Claim 3 above. *Rieger* further teaches in Figure 8 and in column 7 lines 45-67) a laser pulse multiplexing and delaying unit and in Figure 12 a wavelength converting unit (112).

Regarding Claims 24 and 77, see discussion on Claim 3 above. *Rieger* further teaches in Figure 12 an optical amplifier (103) and a wavelength-converting unit (112).

Regarding Claims 27 and 83, see discussion on Claim 3 above. *Rieger* further teaches in Figure 8 and in column 7 lines 45-67 a laser pulse multiplexing and delaying unit and in Figure 12 an optical amplifier (103) and a wavelength-converting unit (112).

Regarding Claims 31 and 91, see discussion on Claim 3 above. *Rieger* further teaches in Figure 8 and in column 8 lines 45-67 a laser pulse multiplexing and delaying unit and in Figure 12 a double-pass optical amplifier (103) and a wavelength-converting unit (112).

Regarding Claims 4, 7, 10, 14, 18, 21, 25, 28, and 32, *Rieger* teaches in column 6 lines 65-67 100 ps pulses.

Art Unit: 2878

Regarding Claims 11, 15, 22, 29, and 33, *Rieger* teaches in column 7 line 55 that the delay is between 100 ps and 10 ns.

Regarding Claims 40, 45, 50, 57, 64, 70, 78, 84, and 92, *Rieger* teaches in Figure 6 a q-switched mode-locked pulse laser comprising a resonator, a pumping unit (61), a Nd:YAG laser medium (67), a Q-switching element (73), and a mode-locker (75).

Claims 5, 8, 12, 16, 19, 23, 26, 30, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Rieger et al.* (US 5,790,574) in view of *Smart* (US 6,339,604) and *Smart* (US 6,281,471), as applied to Claims 3, 6, 9, 13, 17, 20, 24, 27 and 31 above, and further in view of *Unternahrer et al.* (US 6,404,787). *Rieger* does not teach setting the slicing in an arbitrary manner. *Unternahrer* teach in Figure 1 a laser apparatus for selecting a predetermined number of pulses comprising an optical modulator (128) with a controller (126). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a controller in *Rieger*, as taught by *Unternahrer*, to control the optical modulator when slicing pulses to achieve a desired multi-pulse shape.

Claims 43, 48, 53, 60, 67, 73, 81, 87, and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Rieger et al.* (US 5,790,574) in view of *Smart* (US 6,339,604), *Smart* (6,281,471) and *Unternahrer et al.* (US 6,404,787), as applied to Claim 5 above, and further in view of *Amada et al.* (US 5,710,787). *Rieger* does not teach a remote controller. *Amada* teaches in Figure 1 a remote controller (11) to control the laser (1). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a remote control in *Rieger*, as taught by *Amada*, to remotely control various aspects of a laser source, such as the delay unit.

Claims 54, 55, 61, 62, 74, 75, 88, 89, 96, and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view of Smart (US 6,339,604) and Smart (6,281,471), as applied to Claims 49, 56, 63, 69, 83 and 91 above, and further in view of Amada et al. (US 5,710,787).

Regarding Claims 54, 61, 74, 88 and 96, *Rieger* teaches in column 6 lines 65-67 100 ps pulses but do not teach a remote controller. *Amada* teaches in Figure 1 a remote controller (11) to control the laser (1). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a remote control in *Rieger*, as taught by *Amada*, to remotely control various aspects of a laser source, such as the delay unit.

Regarding Claims 55, 62, 75, 89, and 97, see discussion on Claim 54 above. It would have been obvious to one of ordinary skill in the art at the time of the invention that said remote control could be used to control multiple components of said laser apparatus.

Claims 68, 76, 82, 90, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view of Smart (US 6,339,604) and Smart (US 6,281,471), as applied to Claims 63, 69, 77, 83 and 91 above, and further in view of Rieger et al. (US 5,742,634). *Rieger* '574 teaches in Figure 12 producing second harmonic wavelengths (112), but do not teach third, fourth, or fifth harmonic wavelengths. *Rieger* '634 teaches in Figure 6 that fourth harmonic beams may be produced. It would have been obvious to one of ordinary skill in the art at the time of the invention to use higher wavelength harmonics in *Rieger* '574, as taught by *Rieger* '634, to extend the laser wavelength into the visible and the ultra-violet. (See *Rieger* '634 column 5 lines 44-59).



Art Unit: 2878

*Conclusion*


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 571-272-1945. The examiner can normally be reached on Mon-Fri 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Davienne Monbleau*

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